

# An Illustrative Approach to Use SQL Functions: A Review

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Abstract—This paper describes the function used in databases for performing the calculations, modifies the data items and does manipulations on data. It defines the functions, their syntax's and errors occurred during the process. Functions are applied on oracle having SQL and are illustrated through query processing.

Keywords- SQL; NVL; NULLIF; CASE; NVL2; DECODE.

## I. INTRODUCTION

A SQL functions are brought up into oracle databases and are obtainable for its utilization in SQL queries.

## II. BENEFITS OF SOL FUNCTIONS

The feature of SQL is its SQL Functions. These functions perform below tasks:

- 1) Executing calculations on data
- 2) Modification of individual data elements
- 3) Manipulate the results for collection of rows
- 4) Changing date and numbers to display
- 5) Conversion of data types of column

## III. Types of SQL Functions

Single Row Function: These functions are applied on individual rows and then gives output on single row basis. The kinds of single-row functions are:

- On Character: Accepts character input and gives back both character and number digits.
- On Number: Accepts character input and gives back both character and numerical values.
- On Date: It works on values of the DATE data type. Almost all date functions outputs a value of DATE data type butthe MONTHS\_BETWEEN gives a number.
- Conversion :altersvalue from one data type to another
- COALESCE, NVL, NULLIF, CASE, NVL2, DECODE are common functions.

### **Character Functions**

Character cases handling functions: (Lower, Initcapand Upper)

TABLE 1: Character Functions

Function	Result
LOWER('Hello Word')	hello word
UPPER('Hello Word')	HELLO WORD
INITCAP('Hello Word')	Hello Word

## IV. EXECUTION OF QUERIES

selectename"Emp\_Name",lower(ENAME)"Lower\_case",u pper(ename) "Upper\_case", initcap(ename) "Initcap\_case" from emp1 where empno in ('1','2','3','4').

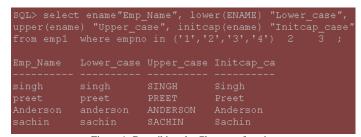


Figure 1: Describing the Character functions

This can work along with where clause: Select ename"Emp\_Name",upper(job) "Job", hiredate from emp1 where ename='Anderson';

```
SQL> Select ename "Emp_Name", upper(job) "Job"
2 , hiredate from emp1 where ename='Anderson'
no rows selected
```

Figure 2: Where clause

Query with initcap, lower, upper function with where clause:

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select ename "Emp\_Name", upper(job) "Job", hiredate from emp1 where initcap (ename) = 'Anderson';

Figure 3: Where clause in Character functions

Character-Manipulation Functions:

CONCAT: Joins the strings.

SUBSTR: Extracts the measurement lengthwise of the sub

LENGTH: It shows how long the string is numerically.

INSTR: helps in finding the numbered position of anyalphabet which is used.

LPAD: It justified the charactersalong the right position.

RPAD: It justified the characters along the left position.

TRIM: Itcuts the front and last charactersout of a string.

TABLE 2: Character - Manipulation Functions

Function	Result
Concat('Data', 'Structure')	DataStructure
Substr("Data Structure",1,4)	Data
Length("Data Structure")	13
Instr('DataStructure', 'S')	5
Lpad(salary,5,'*')	**240
Rpad(salary, 5, '*')	240**
Replace('BACK and BUE','B','BL')	BLACK and BLUE
Trim('D' from 'DataStructure')	ataStructure

Selectename "Name",job "Desg.", concat(ename, job) "Concate Fun." from emp1 where empno in ('1','2','3','4');

```
SQL> select ename "Name" ,job "Desg.", concat (ename, job)
2 "Concate Fun." from empl where empno in ('1','2','3','4');

Name Desg. Concate Fun.

SINGH MANAGER SINGHMANAGER

PREET CLERK PREETCLERK

SACHIN MANAGER SACHINMANAGER

ANDERSON ANALYST ANDERSONANALYST
```

Figure 4: Concatination Function

use || symbol for cancat:

select ename "Name" ,job "Desg.", ename  $\|$  ' is '  $\|$  job "Concate Fun." from emp1 where empno in ('1','2','3','4')

Figure 5: *use* // *symbol for cancat* 

Example of Length and instr

select initcap(ename) "Name",initcap(job) "Desg.", initcap(ename)  $\parallel$  ' is '  $\parallel$  initcap(job) "Concate Fun.",sal "Sal.",length(sal)

"Length\_sal",instr(ename,'a')"contains'a'",instr(upper(ename),'A') "contains lower 'a'"from emp1 where empno in ('1','3','4','7521')

```
SCE' select initesp(enume) "Name", initesp(job) "Desg.", initesp(enume) || 'is' ||
2 initesp(job) "Concate Fun.", sal "dal.", length(sal) "Length_sal",
3 instr(enume, 'a') "contains' a'", instr(upper(enume), 'A') "contains lower "a""
4 from empl where empno in ('l','3','4','7521');

Name Desg. Concate Fun. Sal. Length_sal contains' a' contains lower 'a'

Ward Saleman Ward is Saleman 1250 4 0 2

Singh Sanager Singh is Manager 2050 4 0 0

Sachin Managet Sachin is Manager 500 J 2 2

Anderson Analyst Anderson is Analyst 2500 4 0 1
```

Figure 6: Example of Length and instr

Example of SUBSTR, LPAD, RPAD

Selectename, substr(ename, 1, 4), sal, lpad(sal, 10, '#'), rpad(sal, 10, '#') from emp1

Figure 7: Example of SUBSTR,LPAD,RPAD

Example of Substr and Replace selectename, substr(ename,1,3),replace(ename, 'a','u') from emp1 where ename like '%a%';

Figure 8: Example of Substr and Replace

SQL statement displays the data for those employees whose last names end with the letter n.

Selectename, substr(ename, 1,4), length(ename), instr(ename, 'n') from emp1 where SUBSTR(ename, -1, 1) = 'n';

Figure 9: last names end with the letter n.

## **Number Functions:**

TABLE 3: Number Functions

Function	Purpose
ROUND(column expression,n)	This roundsoffvalues, cols and numerals upto n decimal places, if n is not included then no decimal places, if n is unsignedthenthe numerals to left position of decimal points are rounded off.
TRUNC(column expression, n)	It eliminates the values to n decimal places, if n is non considerableit gives zero value.

```
MOD(m,n) Gives leftovers of m by n.
```

Select round(45.923,2),round(45.923,1),round(45.923,-1), round(44.923,-1) from dual;

```
SQL> select round(45.923,2),round(45.923,1),
2 round(45.923,-1),round(44.923,-1) from dual;

ROUND(45.923,2) ROUND(45.923,1) ROUND(45.923,-1) ROUND(44.923,-1)

45.92 45.9 50 40
```

Figure 10: Round function.

Select trunc(45.923,2),trunc(45.923,1),trunc(45.923,-1),trunc(44.923,-1) from dual;

Figure 11: Trunc function

selectename "Emp\_Name",sal "Sal.", MOD(sal, 1000) from emp1 where empno in ('1','2','3','4');

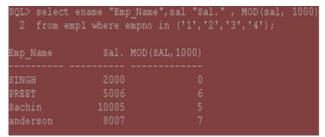


Figure 12: Mod function

## Operating Dates:

The Oracle recordsdates in an interior syntax: Century-year-month-day-hours-minutes- seconds. The automatic date demonstrate syntax is DD-MON-YY selectename, hiredate from emp1;

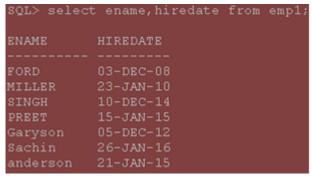


Figure 13: Hire date function

HIREDATE results as DD-MON-YY. This data is stored internally as follows:

Cen	Yr	Mon	D	Hr	Min	SEC
20	12	12	17	17	10	43

## Calculation on Dates

- The resultant date value can be added or subtracted to or from a date.
- 2) The no. of days can be calculated between two by subtracting them.
- Hours to a date can be calculated by dividing the number of hours by 24.

selectename "Name" ,hiredate "Hire\_date",hiredate+7 "7days+hiredate" ,hiredate-7 "7days-hiredate"from emp1

Figure 14: Hire date function

selectename "Name" ,hiredate "Hire\_date", round((sysdate-hiredate)/7,0)"No.ofweeks",round((sysdate-hiredate)/30,0)"No.of months",round((sysdate-hiredate)/365,0)"No.of years" from emp1.

Figure 13: Round on Hire date function

## Features of Date:

- 1)Months\_Between (date1, date2):
  - It helps us in finding the no. of months between two dates. If date1 is afterwarddate2---output is positive; if date1 is earlier than date2, the output is negative. The non-integer portion of the output shows a segment of the month.
- 2)Add\_Months (date, n): Add no. of months into the existing calendar date. It works only on integer values and also can be negative.
- 3)Next\_Day(date, 'char'): Locates the next day date after the given date. It gives output in character.
- 4)Last\_Day (date): Discovers the end date of the month while considering the given date.
- 5)ROUND (date [,'fmt']): Yieldsrounding of the date to specified syntax. If the syntax fmt is neglected, then date is rounded of the nearby date.
- 6)TRUNC (date [, 'fmt']): It yields the date after the time truncated from it. If the syntax fmt is neglected, then date is truncated to the nearby date.

Selectename,hiredate,relievingdate,round(Months\_Between(relievingdate,hiredate),0)"Exp.\_Month",Add\_Months (hiredate,,Next\_Day(hiredate,'SUNDAY'),Last\_Day(hiredate) from emp1;

```
SQL> Select ename, hiredate, relievingdate,
2 round(MONTHS_BETWEEN(relievingdate, hiredate),0)
3 "Exp._Month",ADD_MONTHS (hiredate, 6),
4 NEXT_DAY (hiredate, 'SUNDAY'),
5 LAST_DAY(hiredate) from emp1;

ENAME HIREDATE RELIEVING Exp._Month ADD_MONTH NEXT_DAY( LAST_DAY(

FORD 03-DEC-08 12-FEB-15 74 03-JUN-09 07-DEC-08 31-DEC-08
MILLER 23-JAN-10 15-FEB-16 73 23-JUL-10 24-JAN-10 31-JAN-10
SINGH 10-DEC-14 31-DEC-15 13 10-JUN-15 14-DEC-14 31-DEC-14
FREET 15-JAN-15 31-JAN-16 13 15-JUL-15 18-JAN-15 31-JAN-15
Garyson 05-DEC-12 05-JUL-13 7 05-JUN-13 09-DEC-12 31-DEC-12
Sachin 26-JAN-15 25-JAN-16 12 26-JUL-15 01-FEB-15 31-JAN-15
anderson 21-JAN-12 21-JAN-16 48 21-JUL-12 22-JAN-12 31-JAN-12
```

Figure 14: date function

## In Where Clause

Selectename,hiredate,relievingdate,round(Months\_Between (relievingdate,hiredate),0) "Exp.\_Month" from emp1 WhereMonths\_Between (relievingdate,hiredate) >=12

Figure 15: Hire date function with where clause

Round and Truncate Function with Dates

Select ename, hiredate, ROUND(hiredate, 'MONTH'), TRUNC(hiredate, 'MONTH'), ROUND(hiredate, 'YEAR'), TRUNC(hiredate, 'YEAR'), ROUND(hiredate, 'DAY'), TRUNC(hiredate, 'DAY') FROM EMP1;

```
SQL> Select ename, hiredate, ROUND(hiredate, 'MONTH'),
2 TRUNC(hiredate, 'MONTH'), ROUND(hiredate, 'MONTH'),
3 TRUNC(hiredate, 'YEAR'), ROUND(hiredate, 'DAY'),
4 TRUNC(hiredate, 'DAY') FROM EMP1;

ENAME HIREDATE ROUND(HIR TRUNC(HIR ROUND(HIR TRUNC(HIR ROUND(HIR TRUNC(HIR ROUND HIR TRUNC(HIR TRUNC(HIR ROUND HIR TRUNC(HIR ROUND HIR TRUNC(HIR ROUND HIR TRUNC(HIR TRUNC(HIR ROUND HIR TRUNC(HIR TRUN
```

Figure 16:Round and Truncate on date

Conversion Functions

If Oracle server needs to convert one data type to the other then it can repeatedly .Converts the data to expected data type. The expected data type by the Oracle server conversion can occur wholly and clearly by the user. For this purpose some functions are required to forcefully convert the data casting to another known as conversion functions. The function names follow the conventional input data type TO output data type.

## 1) Conversion Type: Implicit Data Type

CHAR, VARCHAR2 can be wholly changed to NUMBER or DATE. NUMBER type value can be routinely converted to character data by Oracle server. It occurs only when the character signifies a valid number or date type value correspondingly.

For example : the select queries outputs same because Oracle inside allows 1000 and '1000' as same.

Query-1

SELECT ENAME, JOB, SAL

FROM EMP1

WHERE SAL >15000;

Query-2

SELECT ENAME, JOB, SAL

FROM EMP1

WHERE SAL > '15000';

## 2) Conversion: Explicit Data Type

These functions are for single row which are skillful of converting column value, literal or an expression.

TO\_DATE
TO\_NUMBER
TO\_CHAR

# 3) Function: TO\_CHAR

It is required to cast a numeric input value to character type using a fixed model.

## Format:

TO\_CHAR(num1,[format],[nls\_parameter])

Think about the below SELECT query. The query syntax the HIRE\_DATE and SALARY columns of EMPLOYEES table using TO\_CHAR ().

SELECT ENAME,TO\_CHAR (hiredate, 'MONTH DD, YYYY') HIREDATE,TO\_CHAR (sal, '\$99999.99') Salary FROM emp1

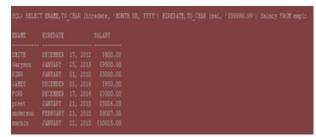


Figure 17: To-char function

TABLE 4: To-char function

Syntax Model	Explanation
,(comma)	This allots the position to a comma. Many no. of commas can be particularlyin a number syntax model.  Boundaries: a number syntax model cannot begin by comma element and it cannot comeat the right arrangement of a decimal character or period.
.(period)	It gives the definite position. Boundaries:Itindicates only one function in a number layout model
\$	Yieldsassessmentwith dollar sign.
0	It begins with zeros and proceedswith zeros at end.
	positive-gives value with the describednumber of digits with space in frontand negative with a minus sign in front.

## 5) Function:TO\_NUMBER

Itconverts a numeric datatype from a character datatype.

## Syntax:

TO\_NUMBER(string1,[format],[nls\_parameter]) list of layout models which can be used to typecast character values as number using TO\_NUMBER.

Layout Model	Explanation
CC	Denotes Century
SCC	It gives Century Before Christstarted with -
YYYY	It displays year having four numbers
SYYY	It gives year before Christ with-prefixed with
_	
IYYY	Gives ISO Year having four numbers
YY	It is Year having 2 digits
	• •
YEAR	Gives Year in alphabets
SYEAR	Yields Year in alphabets, BC prefixed with -
MONTH	Gives Month in alphabets(i.e. January)
MON	Results JAN, FEB
WW	Gives Week number (i.e. 1)
W	Gives Week digit of the month (i.e. 5)
IW	Gives Week digit of the year in ISO
standard.	,
DDD	Results Day of years in numbers (i.e. 365)
DD	Results month day in values (i.e. 28)
D	Gives week day in numbers(i.e. 7)

```
DAY
               Gives Day of the week in alphabets (i.e.
Monday)
FMDAY
              Gives Day of the week in characters (i.e.
Monday)
DY
               Results Day of the week in short character
description (i.e. SUN)
               It Yields Julian Day
              Gives Hour number of the day (1-12)
HH,H12
AM, PM
              Gives AM or PM
              Denotes Number of minutes and seconds (i.e.
MI, SS
59),
SSSSS
              Gives seconds number of day.
                Results Long date format. Depends on
DL
NLS-settings. Use only with timestamp.
                Gives the full period name
EE
FF
               Gives the fractional seconds. Use with
timestamp.
              Gives the fractional seconds. Use with
FF1..FF9
timestamp.
FM
               It Fill Mode.
               It Format Exact: requires proper pattern
FX
matching between date and layout model.
            Returns The Roman cipherfor month (I.. XII)
              Returns The last 2 digits of the year.
RR
RRRR
              Returns The last 2 digits of the year when
used for output. Accepts fout-digit years when used for input.
               It Converts a integer to it's ordinal layout.
ΤH
For example 1 becomes 1st.
              Gives Short time format. Depends on NLS-
settings. Use only with timestamp.
TZD
              It is reduced time zone name. ie PST.
              Denotes Time zone region
TZR
X
            It Denotes Local radix character. It is a period
(.) in America
The SELECT queries written beneathallow numbers as
alphabet intake.
```

SELECT TO\_NUMBER('12,100.73', '999999.99') FROM DUAL;

## 2) Function:TO DATE

This acceptsalphabet values as intake and outputs theplanned date. The TO\_DATE function permits users to use a date in any layout, and then it reverts the input into the default layout used by Oracle 11g.

Syntax:

TO\_DATE( string1, [ format\_mask ], [ nls\_language ] )

TABLE 5: To-date function

r	
Layout Model	Explanation
YEAR	It spelled outYear
YYYY	Gives 4-digit year
IYY,IY,I	Gives Last 3, 2, or 1 digit(s) of ISO year.
IYYY	Four -digit year based on the ISO standard
Q	It gives Quarter of year $(1, 2, 3, 4; JAN-MAR = 1)$ .
MM	Returns Month $(01-12; JAN = 01)$ .
MON	Gives name of month.
MONTH	Results Name of month, covering with blanksupto 9 characters.
RM	Gives Roman numerals for month starting from I-IX.
WW	Returns Week of year (1-53)
W	Gives Week of month (1-5)
IW	On the basis of ISO standard week of year is 1-52or1-53
D	Returns the week day.
DAY	Gives Name of day of week.
DD	Gives month day (1-31).
DDD	Gives year day (1-366).
DY	name of day is abbreviated
J	Returns Julian day;
HH12	Gives day hours (1-12).
HH24	Gives day hour(0-23).
MI,SS	Gives Minute (0-59).
FF	Returns seconds in fraction.
AM,PM	Gives indicator Prime Meridian
TZH,TZM,TZR	Results Time zone in hour, minute.

Example: a character string transforms into a date syntax.

SELECT TO\_DATE('February 15, 1970, 11:00 A.M.', 'Month dd, YYYY, HH:MI A.M.', 'NLS\_DATE\_LANGUAGE = American')

FROM DUAL;

## TO\_DATE(15-FEB-70)

## Common Functions

These are used to holdvoid values in database. The purpose of the common NULL controlling function is to swap the void values with a substitute value.

### NVL

The NVL -deputies another value for a void value. NVL function can be used with all kinds of data types.

## Svntax:

NVL( Arg1, replace with )

This case includes both the constraints which are mandatory.

The SELECT statement will display 'n/a' if an employee has not been assigned any job yet i.e. JOB\_ID is NULL. Else, it would exhibit the actual JOB\_ID value.

SELECT first\_name, NVL(JOB\_ID, 'n/a') FROM employees;

#### NVL2

It is an improvement over the earlier NVL,Oracle presented a facility to standby data not only for NULL columns values but also for NOT NULL columns. NVL2 can be used an alternate for Null (Void) and also for non-null value. Syntax:

NVL2( string1, value if NOT null, value if null )

The SELECT statement under would display 'all' if the JOB\_CODE for an employee is NULL. Finally, not null value of JOB CODE, it would rather display constant value 'Job done'.

SQL> SELECT NVL2(all, 'Job done', 'Bench')FROM employees;

## **NULLIF**

The NULLIF is related to two arguments expr1 and expr2. If expr1 equals to expr2 then it gives NULL otherwise expr1. Dissimilar to it first parameter cannot be void.

# Syntax:

NULLIF (expr1, expr2)

In this the first parameter can be nearer to NULL, but not as NULL. Both the constraints are compulsory for its execution.

The under query yields NULL until values, 16 are equal to each other.

Select NULLIF (16, 16) from dual;

Also, under query yields 'ABC' since both the strings are not equal.

SELECT NULLIF ('ABC', 'MOON')FROM DUAL;

## COALESCE

It is basic form of NVL that gives the first non-void phrase in the parameter list. It requires minimum two parameters but there is no limit on its maximum limit.

## Syntax:

COALESCE (stmt1, stmt2, ...stmt\_n)

Considering the SELECT query. The first not null data served into address domain for the employee.

SELECT COALESCE (address1, address2, address3) Address FROM employees;

The functioning of coalesce function is like to IF..ELSIF..ENDIF construct.

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IF address1 =!NULLthen

result := address1:

ELSIF address2 =!null THEN

result := address2;

ELSIF address3 =!null THEN

result := address3:

ELSE

result := null;

END IF;

Functions: Conditional

Two functions DECODE and CASE are used in SQL statement.

## 1. DECODE function:

The function is similar to conditional statement IF..THEN..ELSE .

Syntax:

DECODE (exp, srch, output [, search, result]... [, default])

DECODE checks in sequence. If equality occurs between statement and search parameter, and it yields the conforming result. If no matches occurs then null is defined. In case types mismatch then oracle within does likely inbuilt alteration to yield the results. Oracle says two null values can be same in case of decode function.

SELECT DECODE(NULL,NULL,'EQUAL','NOT EQUAL') FROM DUAL;

DECODE

----

**EQUAL** 

If NULL expression is found, then Oracle returns output of first search as null. The No. of components are 255.

Select first\_name, salary, DECODE (hire\_date, sysdate, 'NEW JOINEE', 'EMPLOYEE') FROM employees;

# CASE expression

Its mechanism logically similar to DECODE but varies in format and utilization.

Syntax:

CASE [ expression ]

When 1\_condition ... result\_1

When 2 condition ... result 2

....

When n condition ... result n

ELSE output

END

The determined number of parameters in a CASE expression are 255. Each WHEN ... THEN pair calculates as two arguments. To evade exceeding the limit, nested CASE expressions can be used so that the output\_exp itself is a CASE expression.

Select first\_name, CASE

when salary < 100 THEN

'GRADE 1'

when salary > 100 AND salary <

4000 then 'GRADE 2'

ELSE 'GRADE 3'

**END CASE** 

From employees;

ENAM CASE

----

Admin GRADE 2

Jass GRADE 3

Kumar GRADE 1

## V. CONCLUSION

The Query processing of SQL functions comprises of conversion functions has done in this paper . This showed the data manipulation ,formatting, general functions, conditional functioning and its transformation from inbuilt to forceful conversion. In future the work can be done on multiple row functions also.

#### REFERENCES

- [1] Groff and Weinberg, "SQL-The Complete Reference
- [2] Ivan Bayross, "SQL, PL/SQL-The Programming Language of Oracle.
- [3] Koch and KelvinLoney, "Oracle 9i- Complete Reference". S
- [4] Korth, "Database System Concepts".
- https://docs.oracle.com/cd/B19306\_01/server.102/b14200/functions001. htm.
- $[6] \quad https://msdn.microsoft.com/enus/library/gg415714.aspx.$
- [7] http://www.oracle.com/technetwork/database/bi-datawarehousing/wp-sqlnaturallanguageanalysis-2431343.pdf.
- [8] https://ocw.mit.edu/courses/urban-studies-and-planning/11-521-spatial-database-management-and-advanced-geographic-information-systems-spring-2003/lecture-notes/lect4.pdf.
- [9] Jean Habimana," Query Optimization Techniques Tips For Writing Efficient And Faster SQL Queries" International Journal of Scientific & Technology Research volume 4, issue 10, october 2015 issn 2277-8616 22 ijstr©2015.
- [10] Swati Jain and Paras NathBarwa," Performance Analysis of Optimization Techniques for SQL Multi Query Expressions Over Text Databases in RDBMS ",International Journal of Information & Computation Technology. ISSN 0974-2239 Volume 4, Number 8 (2014), pp. 841-852.
- [11] MJ Egenhofer, "Spatial SQL: A query and presentation language" IEEE Transactions on knowledge and data engineering 6 (1), 86-95.
- [12] Max J Egenhofer,"Query processing in spatial-query-by-sketch" in Journal of Visual Languages &Computing ,in volume 8and issue 4.
- [13] J.Herring, R.Larsen and J.Shivakumar, "Extensions to the SQL Language to support Spatial analysis in a Topological Database", GIS/LIS 88, San Antonio, TX, 1988, pp. 741-750
- [14] M.Egenhofer, "why not SQL!", International Journal of Geographical Information Systems ,vo.6,no.2,pp.71-85,1992.

[15] M.Jones, "An introduction to Gofer", Department of Computer Science, Yalle University, Technical report, 1991.

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